[Detailed Description of the Invention]

[0001]

[Field of the Invention]

The present invention relates to a wind power generator installed, for example, on the ocean.

[0002]

[Conventional Art]

Conventionally, in the case of installing a wind power generator, for example, on the ocean, a concrete-made integrated tower is erected by construction on site on the seabed. A wind power generation part is arranged on the tower.

[0003]

[Problems to be Solved by the Invention]

The above described conventional configuration needs take long time to build a tower. Consequently construction costs high and might give rise to bad influence to periphery environments in fishing grounds and the like.

[0004]

In view of the above described problem, an object of the present invention is to provide a wind power generator by building a tower for a short period to little affect periphery environments badly to make constructions costs inexpensive.

[0005]

[Means for Solving the Problems]

In order to attain the above described objects, the invention according to claim 1 is a wind power generator including a tower

and a wind power generation part, the tower being erected in soil and the wind power generation part being arranged on the tower, characterized in that the tower is configured by a hollow foundation block which is installed on soil and into inside of which weight is taken and a tower body put on the foundation block; and the tower body is integrally connected to the foundation block with a connector.

[0006]

According to the above described configuration, the tower can be built for a short period to little affect periphery environments badly to make constructions costs inexpensive just by producing, in advance, a hollow foundation block and a tower body in a factory in the case of building a tower supporting a wind power generation part; installing the foundation block in soil and putting weight in its interior; thereby bringing the foundation block into a state of immobility; and thereafter putting the tower body on the foundation block; and coupling the tower body with the foundation block with the connector.

[0007]

The invention according to claim 2 is characterized in that the foundation block is fit to inside a fall-prevention frame embedded in arenaceous soil in the invention according to claim 1.

[0008]

According to the above described configuration, even if soil is arenaceous, a tower can be erected so as not to tip by

installing a foundation block on the arenaceous soil through a fall-prevention frame.

[0009]

The invention according to claim 3 is characterized in that a lower part of the foundation block is fit into inside a concave part with a diameter slightly larger than the outer diameter of the foundation block formed in rocky soil in the invention according to claim 1.

[0010]

According to the above described configuration, the tower can be erected firmly by utilizing the rocky soil with large strength.

[0011]

The invention according to claim 4 is characterized in that the tower body consists of a plurality of stacked split blocks in the invention according to any of claims 1 to 3.

[0012]

According to the above described configuration, the tower body is split small and therefore can be produced easily. In addition, by increasing and decreasing the number of the split blocks, height of the tower can be adjusted.

[0013]

The invention according to claim 5 is characterized in that the tower body consists of one cylindrical block in the invention according to any of claims 1 to 3.

[0014]

According to the above described configuration, only by erecting one cylindrical block on the foundation block, the tower with predetermined height can be formed.

[0015]

In invention according to claim 6, the split block is formed to shape a hollow cylinder and a plurality of circulation holes configured to be utilizable as a fish bed is formed to allow fish to enter and exit from the holes in the invention according to claims 4 or 5.

[0016]

According to the above described configuration, split blocks forming a tower can be effectively utilized as a fish bed.

[0017]

[Embodiments of the Invention]

Embodiments of the present invention will be described based on the drawings. Figure 1 and Figure 2 illustrate a wind power generator being a first embodiment of the present invention. A tower 1 is erected to arenaceous seabed (ground) Ga. The upper part of the tower 1 is caused to protrude upward from the water level W. L. A wind power generation part 3 is arranged on that tower 1 though a platform 2. The tower 1 is configured by a hollow foundation block 1A installed on the arenaceous seabed Ga through a fall-prevention frame 4 and a tower body 1B put on the foundation block 1A. The tower body 1B is integrally connected to the foundation block 1A with a connector 5.

[0018]

The fall-prevention frame 4 is made of concrete and has a cylindrical frame body 4a embedded into the arenaceous seabed Ga and caused to protrude its upper part upward from the arenaceous seabed Ga and a flange part 4b horizontally extending inside the arenaceous seabed Ga from the circumferential surface of the frame body 4a. The frame body 4a prevents sand from scattering due to the self weight of the tower 1 and the flange part 4b prevents the tower 1 from tipping.

[0019]

The above described foundation block 1A is made of concrete and is formed to shape a hollow box with a circular outer wall part 7, a bottom wall part 8 and a ceiling wall part 9. An annular protruding part 10 with the same diameter as the outer wall part 7 is provided to protrude on the upper side outer peripheral border of the ceiling wall part 9. That foundation block 1A is fit into inside the upper part of the frame body 4a and is put on a support part 11 provided to protrude on the inner surface of the frame body 4a. Sand (weight) s is introduced from a center through hole 9a of the ceiling wall part 9 to fill its inside, thereby enabling the gravity center of the tower 1 to descend.

[0020]

The above described tower body 1B is configured by a plurality of concrete-made split blocks 1a to 1d. The respective split blocks 1a to 1d are formed to shape a hollow cylinder comprising a circular outer wall part 12 and a ceiling wall part 13 with its

lower side being opened. An annular protruding part 14 with the same diameter as the outer wall part 12 is provided to protrude on the upper side outer peripheral border of the ceiling wall part 13. The upper stage of split blocks 1a to 1d is set to have smaller outer diameter. The lower parts of the respective split blocks 1a to 1d are fit into inside the respective annular protruding parts 10 and 14. Thereby those respective split blocks 1a to 1d are sequentially stacked on the foundation block 1A.

[0021]

According to the above described configuration, the tower body 1B is split small and therefore can be produced easily. In addition, by increasing and decreasing the number of the split blocks 1a to 1d, height of the tower 1 can be adjusted.

[0022]

A great number of large and small circulation holes 15 are formed in the outer wall part 12 of the above described respective split blocks 1a to 1d to allow entrance and exit of fish. The sea water is allowed to freely circulate inside the respective split blocks 1a to 1d. The ceiling wall part 13 of appropriate split blocks 1a to 1d are provided with an illuminating lamp 16 in its lower side. By lighting the illuminating lamp 16 with a part of electric power generated by the wind power generation part 3, the tower body 1B is utilized as a fish bed.

[0023]

The wind power generation part 3 includes a column support 18 erected on the platform 2, an electric generator 19 provided on the

column support 18, a propeller windmill 20 provided to protrude radially on a rotary shaft 19a of the electric generator 19. The windmill 20 receives wind to rotate and thereby activate the electric generator 19. Here, instead of the propeller windmill 20, respective kinds of windmills such as a Robinson type and a Savonius type can be adopted.

[0024]

The above described connector 5 includes a lower connecting rod 5a connected to the bottom wall part 8 of the above described foundation block 1A and extending upward through the center through hole 9a of the ceiling wall part 9 and an upper connecting rod 5b going through the center of the bottom plate part 18a of the above described column support 18 and the platform 2, being inserted into the center through hole 13a of the ceiling wall part 13 of each split block 1a to 1d and brought into flange coupling with the above described foundation connecting rod 5a. A nut 21 is screwed into an upper end screw part of the upper connecting rod 5b and is pressed to contact to the above described bottom plate part 18a. Thereby the wind power generation part 3 and the tower body 1B are integrally connected to the foundation block 1A.

[0025]

According to the above described configuration, the tower 1 can be built for a short period to little affect periphery environments badly to make constructions costs inexpensive just by producing, in advance, the hollow foundation block 1A and the respective split blocks 1a to 1d in a factory in the case of

building the tower 1 supporting the wind power generation part 3; installing the foundation block 1A in the arenaceous seabed Ga through the fall-prevention frame 4; filling the interior of the foundation block 1A with sand s; thereby bringing the foundation block 1A into a state of immobility; and, thereafter, stacking the split blocks 1a to 1d onto the foundation block 1A to form the tower body 1B; and coupling the tower body 1B and the wind power generation part 3 together with the connector 5.

[0026]

Figure 3 illustrates major parts of a wind power generator being a second embodiment of the present invention. A lower part of the foundation block 1A is fit into inside a concave part 23 with a diameter slightly larger than the outer diameter of the foundation block 1A formed in rocky soil Gb. The gap between the concave part 23 and the foundation block 1A is filled with sand s. Since configurations not specified above are approximately the same as in the first embodiment, like reference characters will designate the same parts throughout the figures thereof to omit description thereof.

[0027]

According to the above described configuration, the tower 1 can be erected firmly by utilizing the rocky soil Gb with large strength.

[0028]

Figure 4 illustrates major parts of a wind power generator being a third embodiment of the present invention. The respective

split blocks 1a to 1d of the tower body 1B is formed like a rectangular box with an open lower side. A foundation block 1A and a frame body 4a of a fall-prevention frame 4, which are not illustrated in the drawing, are rectangularly formed to accommodate themselves to the shape of those respective split blocks 1a to 1d. Since configurations not specified above are approximately the same as in the first embodiment and the second embodiment, like reference characters will designate the same parts throughout the figures thereof to omit description thereof.

[0029]

According to the above described configuration, the split blocks 1a to 1d are formed rectangular and, therefore, are produced easily.

[0030]

Figure 5 illustrates a wind power generator being a fourth embodiment of the present invention. The tower body 1B consists of one concrete-made cylindrical block. Since configurations not specified above are approximately the same as in the first to third embodiments, like reference characters will designate the same parts throughout the figures thereof to omit description thereof.

[0031]

According to the above described configuration, only by erecting one cylindrical block on the foundation block 1A, the tower 1 with predetermined height can be formed.

[0032]

In the above described first to fourth embodiment, the case of erecting the tower 1 in the arenaceous seabed Ga or the rocky soil Gb was exemplified for description. Without being limited thereto, the tower 1 can be applied to the case of being erected on the land.

[0033]

[Advantages of the Invention]

According to an aspect of the invention according to claim 1, the tower can be built for a short period to little affect periphery environments badly to make constructions costs inexpensive just by producing, in advance, a hollow foundation block and a tower body in a factory in the case of building a tower supporting a wind power generation part; installing the foundation block in soil and putting weight in its interior; thereby bringing the foundation block into a state of immobility; and thereafter putting the tower body on the foundation block; and coupling the tower body with the foundation block with the connector.

[0034]

According to the invention according to claim 2, even if soil is arenaceous, a tower can be erected so as not to tip by installing a foundation block on the arenaceous soil through a fall-prevention frame.

[0035]

According to the invention according to claim 3, if the soil is rocky, by forming a concave part in the rocky soil and fitting a lower part of a foundation block to inside the concave part, the